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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/573,929

Applicant(s)

KUMAKI ET AL.

Examiner

Phat X. Cao

Art Unit

2814

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-7 and 13-27 is/are pending in the application.
- 4a) Of the above claim(s) 2 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-7 and 13-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The Request for Continued Examination in reply filed on 03/18/10 is acknowledged.
2. The cancellation of claims 3 and 8-12 in Paper filed on 03/18/10 is acknowledged.

Claim Rejections - 35 USC § 103

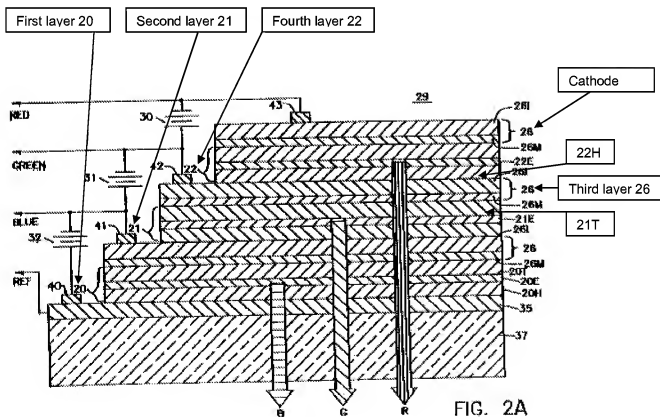
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4-6, 7, 13-15, 19, 20-23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al (US 5,703,436) in view of Liao et al (US 6,717,358) – previously cited.

Regarding claims 1, 20, 21, and 22, Forrest (Fig. 2A) discloses a light-emitting element comprising: an anode 35 connected to an anode terminal 40; a first layer 20 formed over the anode layer 35 and containing a light-emitting material 20E (column 4, lines 51-54); a second layer 21 formed over the first layer 20 and containing an organic compound 21T (column 4, lines 54-56); a third layer 26 (corresponding to center electrode 26) formed over and being in direct contact with the second layer 21, the third layer 26 including a transparent conductive film comprising a metal (column 4, lines 58-66); a fourth layer 22 formed over and being in contact with the third layer 26 and containing a hole-transporting medium 22H (column 4, lines 49-51), and a cathode 26

connected to the cathode terminal 43 (column 5, lines 62-64) formed over and being in direct contact with the fourth layer 22, the cathode 26 containing a metal (column 4, lines 58-66), wherein the transparent conductive film 26 (center electrode 26) comprises a material selected from Indium-Tin-Oxide (ITO) (column 4, lines 58-66).



Forrest does disclose that the second layer 21 contains a layer 21T (or electron-transporting layer) of an organic compound and the fourth layer 22 contains a layer 22H of a hole-transporting medium, but does not disclose that the electron transporting layer 21T also contains an electron-supplying material and a metal oxide and the hole-transporting medium layer 22H also contains an electron-accepting material.

However, Liao (Figs. 1 and 2) teaches a light-emitting element comprising: a first layer 120.1 containing a light-emitting material (column 3, lines 57-59); a second layer 131 containing an organic compound, an electron-supplying material and a metal oxide (column 7, lines 60-67 through column 8, lines 1-15); a third layer 132 including a transparent conductive film comprising a metal (column 9, lines 6-15); and a fourth layer 133 containing a hole-transporting medium (column 8, lines 15-17), wherein the first layer, the second layer, the third layer and the fourth layer are sandwiched between a first electrode 110 and a second electrode 140, wherein the first layer, the second layer, the third layer, the fourth layer, and the second electrode are provided sequentially over the first electrode 110, wherein the second electrode 140 has a layer containing metal (column 13, lines 1-6), and wherein the transparent conductive film comprises a material selected from zinc oxide and molybdenum oxide (column 9, lines 6-15). Furthermore, it has been held that selecting a known material on the basis of its suitability for the intended use is a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. There was absent evidence of disclosure of criticality for selecting the electron transporting material (or second layer) and the hole transporting material (or fourth layer) as claimed. Therefore, it would have been obvious to substitute the

electron transporting material and the hole transporting material of Liao for the electron transporting material 21T and the hole transporting material 22H of Forrest because of their equivalence for their use in the semiconductor art as the electron transporting material and the hole transporting material and the selection of any of these known materials to be used as an electron transporting material for the second layer and a hole transporting layer for the fourth layer of Forrest would be within the level of ordinary skill in the art.

Regarding claims 4-7, Liao (Figs. 1 and 2) further teaches that the organic compound contained in the second layer 131 is an electron-transporting organic compound comprising a metal complex (column 7, lines 60-67), and the electron-supplying material is alkaline/rare-earth metal selected from Li and Cs (column 8, lines 1-15).

Regarding claims 13-15, Liao (Figs. 1 and 2) further teaches that the fourth layer 133 contains an organic compound doped with an electron-accepting material (column 8, lines 35-48), and the organic compound is a hole transporting material having an aromatic amine skeleton (column 8, lines 15-34).

Regarding claim 19, Forrest also discloses that the light-emitting device is applied in many electronic device applications (column 1, lines 8-10).

Regarding claim 23, Liao discloses that the metal oxide includes in the second layer 131 containing an organic compound (column 7, lines 60-67). Liao does not disclose that the metal oxide is selected from the materials as claimed.

However, it has been held that selecting a known material on the basis of its suitability for the intended use is a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. There was absent evidence of disclosure of criticality for selecting a metal oxide material as claimed. Therefore, it would have been obvious to use the metal oxide material as claimed for the metal oxide material of Liao because of their equivalence for their use in the semiconductor art as the n-type dopant and the selection of any of these known metal oxide materials to be used as an n-type dopant material for the n-type doped organic layer of Liao would be within the level of ordinary skill in the art.

Regarding claim 27, Forrest (Fig. 2A) further discloses that the first layer 20 is formed in multilayer structure.

5. Claims 16-18 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al and Liao et al as applied to claims 13, 20, 21, and 22 above, and further in view of Kido et al (US 2003/0189401).

Regarding claims 16-17, 24, and 25, Liao discloses that the hole transporting layer 133 (Fig. 2) contains an organic compound of NPB (column 8, lines 15-34) and is doped with an electron accepting material of the inorganic material such as metal halides (column 8, lines 35-45). Liao does not disclose that the electron accepting material of the inorganic material is a metal oxide.

However, Kido teaches that the hole transporting layer contains an organic compound of NPB (pars. [0028]-[0032]) and is doped with an electron accepting material of the inorganic material such as metal halide (par. [0034]) or metal oxide of vanadium oxide (pars. [0033]-[0035]). Accordingly, it would have been obvious to use

inorganic material such as metal halide or metal oxide (vanadium oxide) as an electron accepting material because of their equivalence for their use in the LED technology (as taught by Kido) and the selection of any of these known equivalents to be used as an electron accepting material of Liao would be within the level of ordinary skill in the art.

Regarding claims 18 and 26, Kido teaches that the metal oxide is vanadium oxide (par. [0035]), but does not teach that the metal oxide is molybdenum oxide.

However, it has been held that selecting a known material on the basis of its suitability for the intended use is a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. There was absent evidence of disclosure of criticality for selecting a metal oxide material made of molybdenum as claimed. Therefore, it would have been obvious to substitute molybdenum oxide for the vanadium oxide of Kido because of their equivalence for their use in the semiconductor art as the p-type dopant and the selection of any of these known metal oxide materials to be used as an p-type dopant material for the p-type doped organic layer would be within the level of ordinary skill in the art.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir.

1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1, 4-7, 13-17, 18-19, and 20-26 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15-31 of copending Application No. 10/575,202 (or US 2007/0090376 – cited in IDS). Although the conflicting claims are not identical, they are not patentably distinct from each other because both copending Application and instant application claim a light-emitting element including a first layer, a second layer, a third layer, and the fourth layer are sandwiched between an anode and a cathode. Moreover, independent claims 1, 20, 21, and 22 in the instant application are either broader version of independent claim 15 of the copending application or are obvious variations thereof. For example, claim 15 in copending application claims "wherein the cathode has a layer containing reflective metal", whereas claims 1 and 20-22 in the instant application claims "wherein the second electrode has a layer containing metal". The fact is that both copending application and the instant application are claiming common subject matter.

Dependent claims 4-7, 13-17, 18-19, and 23-26 of the instant application claim the same subject matters as the subject matters claimed in dependent claims 17-31 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

8. Applicant's arguments with respect to amended claims have been considered but are moot in view of the new ground(s) of rejection.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (571)272-1703. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571)272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/P. X. C./
Primary Examiner, Art Unit 2814

/Phat X. Cao/
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